WHAT IS CLAIMED IS:

1. Process for sputter-induced precipitation of metal oxide layers on substrates by means of a reactive sputter process, **characterized in that** the plasma charge acting upon the target to be evaporated is provided with electric power selected such that the metal oxide layers precipitated on the substrates to be coated are deposited at a precipitation rate of $\geq$ 4 nm/s, whereby during the coating process the substrate to be coated is arranged stationary in relation to the target material to be evaporated.

2. Process for sputter-induced precipitation of metal oxide layers on substrates by means of a reactive sputter process, **characterized in that** the oxide layers to be precipitated on the substrate to be coated are deposited at a precipitation rate of $\geq$ 40 nm m/min, whereby the substrate to be coated is moved along in front of the target material to be evaporated.

3. Process according to claim 1 or 2, **characterized in that** the electrodes are connected in a conductive manner to the outputs of an alternating current source whereby the alternating frequency of the alternating current provided for the electrical supply of the plasma discharge is selected between 10k Hz and 80 kHz.

4. Process according to at least one of the claims 1 to 3, **characterized in that** the precipitated oxide layer is a TiO_2 layer or an SiO_2 layer.

5. Optical-effect layer system, arranged on substrate surfaces and produced according to at least one of the preceding claims, which layer system exhibits an order of layers composed of alternating low refractive and high refractive layers, where the individual oxide layers are precipitated on the substrate surfaces to be coated by means of a sputter-induced evaporation and precipitation process carried out in a vacuum chamber and where the sputter plasma is supplied by alternating current fed to the plasma electrodes, **characterized in that** the predominant part of the oxide layer exhibits a rutile structure.

6. Layer system according to claim 5, **characterized in that** the metal oxide layers are deposited at a precipitation rate of > 4 nm/s on the target which is arranged stationary in relation to the sputter cathode.

7. Layer system according to claim 5, **characterized in that** the oxide layer is an SiO_2 layer which is deposited at a precipitation rate of > 5 nm/s on the substrate which is arranged stationary, preferably spatially secure in relation to the sputter cathode.

8. Layer system according to at least one of the claims 5 through 8, **characterized in that** the alternating frequency of the alternating current fed to the sputter electrode lies between 10 kHz and 80 kHz,

9. A process for sputter-induced precipitation of metal oxide layers on substrates by means of a reactive sputter process, said process comprising:

providing a target to be evaporated and creating a plasma charge thereabout;

providing electric power to the plasma charge acting upon the target to be evaporated, said electric power being selected such that the metal oxide layers precipitated on the substrate to be coated are deposited at a precipitation rate greater than or equal to 4 nm/s; and;

maintaining the substrate to be coated in stationary relation to the target material to be evaporated during the coating process.

10. A process for sputter-induced precipitation of metal oxide layers on substrates by means of a reactive sputter process, said process comprising:

providing a target material for said sputter process;

depositing the oxide layers to be precipitated on the substrate to be coated at a precipitation rate greater than or equal to 40 nm m/min; and

moving the substrate to be coated along in front of the target material to be evaporated.

11. Process according to claim 9, wherein electrodes are connected in a conductive manner to outputs of an alternating current source whereby the alternating frequency of the alternating current provided for the electrical supply of the plasma discharge is selected between 10 kHz and 80 kHz.

12. Process according to claim 10, wherein electrodes are connected in a conductive manner to outputs of an alternating current source whereby the alternating frequency of the alternating current provided for the electrical supply of the plasma discharge is selected between 10 kHz and 80 kHz.

13. Process according to claim 9, wherein the precipitated oxide layer is a TiO_2 layer or an SiO_2 layer.

14. Process according to claim 10, wherein the precipitated oxide layer is a TiO_2 layer or an SiO_2 layer.

15. Process according to claim 11, wherein the precipitated oxide layer is a TiO_2 layer or an SiO_2 layer.

16. Process according to claim 12, wherein the precipitated oxide layer is a TiO_2 layer or an SiO_2 layer.

17. An optical-effect layer system comprising:

a substrate having a surface;

a plurality of oxide layers applied successively over said surface according to the process of claim 9;

the layers being applied to the substrate surface in an order such that the layers alternate between being low refractive layers and high refractive layers;

the individual oxide layers being precipitated on the substrate surface by means of a sputter-induced evaporation and precipitation process carried out in a vacuum chamber, and wherein sputter plasma is supplied alternating current fed to plasma electrodes;

the oxide layer having a predominant part having a rutile structure.

18. A layer system according to claim 17, wherein the metal oxide layers are deposited at a precipitation rate greater than 4 nm/s on the target which is arranged stationary in relation to the sputter cathode.

19. A layer system according to claim 17, wherein the oxide layer is an SiO_2 layer which is deposited at a precipitation rate greater than 5 nm/s on the substrate which is arranged stationary in relation to the sputter cathode.

20. A layer system according to claim 17, wherein the alternating frequency of the alternating current fed to the sputter electrode lies between 10 kHz and 80 kHz.

21. An optical-effect layer system comprising:

a substrate having a surface;

a plurality of oxide layers applied successively over said surface according to the process of claim 10;

the layers being applied to the substrate surface in an order such that the layers alternate between being low refractive layers and high refractive layers;

the individual oxide layers being precipitated on the substrate surface by means of a sputter-induced evaporation and precipitation process carried out in a vacuum chamber, and wherein sputter plasma is supplied alternating current fed to plasma electrodes;

the oxide layer having a predominant part having a rutile structure.